

A LIST OF THE APHIDIDÆ OF ILLINOIS, WITH NOTES ON SOME OF THE SPECIES

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(Continued from p. 419)

In the first part of this paper (Jour. Econ. Ent., Vol. III, Oct., 1910, p. 410) *Pemphigus corrugatans* Serrine was questionably listed from Illinois. I have since had an opportunity, through the courtesy of Mr. J. T. Monell, to examine cotypes of *P. corrugatans* in Monell's collection and find that my Le Roy specimens are not that species. Plate 31, figures 1 and 2 are camera lucida drawings of the wing and antenna from the cotypes mentioned above. The label on the slide examined is as follows,—“454^{xa} cotypes *Pemphigus corrugatans*. Winged adults, pupa, and larvæ of II? From curled colored leaves of *Cratægus coccinea* var. I. A. C. 6-26-93. In balsam. F. A. S.” Plate 31, figures 3 and 4 were drawn from winged viviparous females of a *Pemphigus* corrugating the leaves of *Cratægus* sp. at LeRoy, Ill., July 7, 1907. This latter may be Fitch's *P. pyri*.

^d*Aphis apocyni* Koch: Thomas 8th Rept. St. Ent. Ill. (1880), p. 94. The *Apocynum* aphid characterized by Thomas is probably not Koch's *apocyni* and it is still to be proven that the European species occurs in America. First reported by Thomas.

**A. asclepiadis* Fitch: Oestlund, Bull. Geol., and Nat. Hist. Surv. Minn. No. 4 (1887), p. 60. A very common species on *Asclepias*.

A. atriplicis Linn.: Hayhurst, Annals Ent. Soc. Amer., Vol. II (1909), p. 88, figs. Common on *Chenopodium album* throughout the state, especially common in southern Illinois. First reported by Monell.

A. avenæ Fab.: Pergande, Bull. Div. Ent., U. S. D. A., No. 44 (1904), p. 5, figs. A common wheat aphid but rarely destructively abundant. First reported by Forbes.

A. bakeri Cowen: Gillette, Jour. Econ. Ent., Vol. I (1908), p. 364, figs.; Davis, Annals Ent. Soc. Amer., Vol. I (1908), p. 259, figs. A common species throughout the state on red clover. First reported by the writer.

A. brassicæ Linn.: Weed, Insect Life, Vol. III (1890), p. 289, 1 fig.; Sanborn, Kans. Uni. Sci. Bull., Vol. III (1904), p. 54, 1 fig. Our most generally destructive aphid of the vegetable gardens, and a most difficultly controlled one in the commercial gardens, the expenses of fighting the aphid soon using up the small profit which is to be made. First reported by Thomas(?).

**A. brevis* Sand.: 13th Ann. Rept. Del. Agr. Expt. Sta. 1901 (1902),

p. 157, 2 figs. Common in Central Illinois on the red haw (*Cratægus coccinea*.)

†*A. carduella* Walsh: Oestlund, Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 59. First reported by Walsh. I am unacquainted with this species.

**A. cardui* Linn.: Oestlund, Bull., Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 65. A very common species on the purple thistle, invariably attended by ants (*Formica* sp.).

†*A. cephalanthi* Thos.: Davis, Annals Ent. Soc. Amer., Vol. II (1909), p. 40, figs. Not uncommonly injuriously abundant on the button-bush shrub (*Cephalanthus occidentalis*), which is often used in ornamental plantings. It usually becomes most abundant in the fall of the year. First reported by Thomas.

**A. cerasifoliæ* Fitch: Oestlund, Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 51. A serious pest of *Prunus pennsylvanicus*, a shrub commonly planted in parks, and living on the undersides of the leaves, curling them badly, and thus seriously disfiguring the natural beauty. I have found them so abundant as to disfigure every leaf on a clump of these shrubs and to cause the leaves to turn brown and often fall off in midsummer.

**A. coreopsidis* Thos.: 8th Rept. St. Ent. Ill. (1880), p. 59, figs.; Oestlund, 14th Rept. Geol. and Nat. Hist. Surv. Minn. (1886), p. 38, (*A. frondosæ*). Last fall (1909) this species became very abundant at Oak Park, Ill., infesting the stem, leaves, flowers, and flower stalks, principally the two latter, of *Bidens vulgata*, and this fall (October 3, 1910) I found it rather common on *Bidens bipinnata* at Anna, Illinois. Infested plants in confinement were continually watched until the plants and aphids were killed by the cold, with no sign of an oviparous generation. Noticing the marked resemblance between the descriptions of *Siphonophora coreopsidis* Thos. and *A. frondosæ* Oestl., I wrote Professor Oestlund who kindly sent me a mounted specimen of his species. I have thus been able to positively identify my Oak Park specimens as the species described as *A. frondosæ*. Mr. Monell has sent me specimens from *Coreopsis* collected in St. Louis, which he determined as *A. coreopsidis* and also a copy of the original type color notes. From all these sources I have studied and compared my species and conclude that the two species, *A. frondosæ* and *A. coreopsidis*, are synonymous. In all specimens the color notes and habits agree quite well. Mr. Monell's specimens were smaller but the relative antennal measurements agree with my specimens excepting in some specimens the length of filament VI is longer, but this appears to be quite variable and can hardly be considered of specific value. Camera lucida drawings, of

the antenna, cornicle and style of the winged viviparous female are given in Plate 32, figures 11, 12, and 13, respectively.

I herewith give antennal measurements which I have made:

| Data on slide | Sensoria | | | Antennal lengths in mm. | | | | | | |
|---|----------|-------|-------|-------------------------|--------|--------|--------|--------|------------|---------------------|
| | III | IV | V | I | II | III | IV | V | VI base | VI fila- ment |
| Aphis frondosæ..... | 11 | 8 | 4 | 0.0652 | 0.0570 | 0.3749 | 0.2282 | 0.2200 | 0.1141 | 0.4727 |
| 8-30-'03..... | 11 | 7 | 3 | 0.0652 | 0.0570 | 0.3830 | 0.2526 | 0.2282 | 0.1059 | 0.4645 |
| O. W. Oestlund Coll..... | 12 | 6 | 4 | 0.0733 | 0.0570 | 0.3423 | 0.2282 | 0.2282 | ..... | ..... |
| Oak Park, Ill. | 12 | 7 | 4 | 0.0733 | 0.0570 | 0.3586 | 0.2282 | 0.2119 | ..... | ..... |
| On Bidens vulgatus 27th Sept. '09, Davis | 11 | 8 | 2 | 0.0652 | 0.0489 | 0.3423 | 0.2282 | 0.2119 | 0.1141 | 0.4564 |
| Oak Park, Ill. | 11 | 7 | 3 | ..... | ..... | 0.3586 | 0.2445 | 0.2119 | 0.1059 | 0.4482 |
| On Bidens vulgatus 27th Sept. '09, Davis ..... | ..... | ..... | ..... | ..... | ..... | 0.3749 | 0.2363 | 0.2119 | 0.0978 | 0.4401 |
| Oak Park, Ill. .... | ..... | ..... | ..... | ..... | ..... | 0.3586 | 0.2200 | 0.2282 | 0.0896 | 0.4401 |
| On Bidens vulgatus 27th Sept. '09, Davis | 11 | 8 | 4 | ..... | ..... | 0.3749 | 0.2852 | 0.2445 | 0.1059 | ..... |
| Oak Park, Ill. | 12 | 8 | 4 | ..... | ..... | 0.3586 | 0.2934 | 0.2526 | 0.1141 | 0.4238 |
| On Bidens vulgatus 8th Oct. '09, Davis..... | 13 | 6 | 5 | 0.0570 | 0.0489 | 0.2771 | 0.1793 | 0.1793 | 0.0733 | 0.4645 |
| 684x, St. Louis, Mo. | 15 | 7 | 3 | 0.0570 | 0.0489 | 0.3015 | 0.1793 | 0.1711 | 0.0896 | 0.4492 |
| On Coreopsis 25th July '08. J. T. Monell coll. | 14 | 6 | 4 | ..... | ..... | 0.2771 | 0.1874 | 0.1793 | 0.0815 | ..... |
| 684x, St. Louis, Mo. .... | ..... | ..... | ..... | ..... | ..... | 0.2852 | 0.1956 | 0.1793 | 0.0815 | 0.4645 |
| On Coreopsis 25th July '08, J. T. Monell coll. | ..... | ..... | ..... | ..... | ..... | ..... | 0.1956 | 0.1793 | 0.0815 | 0.3993 |
| 684x, St. Louis, Mo. .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| On Coreopsis 25th July '08. J. T. Monell coll. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

^d*A. cornifolia* Fitch: Cat. Hom. N. Y., 1851, p. 65; Oestlund, Bull. Geol. and Nat. Hist. Surv., Minn., No. 4 (1887), p. 53. This species has often been confused with the more common *Aphis* on *Cornus*, *A. helianthi*. In his original description of *cornifolia* Fitch says, "Apterous females black," and Oestlund describes the color of the abdomen of the winged viviparous female as "dark brown." I have received from Mr. Monell a note on this species, an abstract of long color notes made by Mr. Th. Pergande. I copy in full as received from Mr. Monell.

"315^x On *Cornus* lvs. Maryland, May 26-27, '85 (Abstract of long color notes). *Winged*:—Hd. and thorax, nectaries and tail black. Abdomen dark brownish, almost blk. Wings pale dusky. *Apterous*. Dull blk., the abdomen somewhat brownish. *Pupa*. Hd. and thorax dark greenish covered with fine mealy grayish excretion. Abdomen greenish brown with grayish excretion, often two pale distinct stripes of excretion on dorsum. Wing pads dull yellowish.

"This is all *essentials* of color notes verbatim— from Th. Pergande. J. T. Monell."

Mr. Monell very kindly mounted some of the remains (from alcohol) of the specimens from which these notes were made, but they are so shrunken as to be of little value in working out the characters.

The species recently referred to by Professor Gillette as *Aphis cornifolia* (Jour. Econ. Ent., Vol. III, Oct. 1910, p. 405) is not, in my opinion the true *cornifolia*, but rather the *helianthi* of Monell. This species has never been positively reported from Illinois, all records of the occurrence of *cornifolia* in this state apparently referring to the migrant form of *helianthi*.

**A. cratægifolia* Fitch: Sanborn, Kans. Uni. Sci. Bull. Vol. III, No. 1 (1904), p. 53, 1 fig. A common species on *Cratægus* in the Chicago parks. It curls the leaves and is often injuriously abundant.

†*A. folsomii* Davis: Ent. News, Vol. XIX (1908), p. 143, 1 pl. Common at Urbana and Chicago attacking Virginia creeper. First reported by the writer.

A. forbesi Weed: Sanderson, 12th Ann. Rept. Del. Agr. Exper. Sta. f., 1900 (1901), p. 143, 6 figs., 1 pl. Common throughout the state, sometimes a serious pest. First reported by Forbes.

A. gossypii Glov.: Pergande, Insect Life, Vol. 7 (1895), p. 309. One of our most common and destructive aphids. In the western part of the state in the melon fields, they do much damage annually. In greenhouses they are often very injuriously abundant on cucumbers as well as on althæa, Hibiscus and Easter lily, especially in more or less neglected houses. First reported by Forbes (as *cucumeris*).

**A. houghtonensis* Troop: Ent. News, Vol. XVII (1906), p. 59, 3 figs. This species was found very common, curling the leaves of gooseberry shrubs growing wild at Aurora, Ill., June 17 and 22, 1910. The drawings by Mr. Heidemann in the article cited above represent the general characters of the species exceedingly well. The antenna of the winged viviparous female, showing the number and position of the sensoria, is illustrated in Pl. 31, fig. 5.

A. helianthi Monl.: Bull. U. S. Geol. and Geog. Surv., Vol. V (1879), p. 26; Weed, Psyche, Vol. V (1888), p. 123. This aphid is very common on various species of *Helianthus*, especially *H. grosseserratus*, *H. divaricatus*, and *H. annuus*. The green aphid so common on *Cornus* leaves in spring and fall is apparently the same species, and not the *A. cornifolia* of Fitch as has been so commonly supposed. See discussion above under *cornifolia*. Mr. Monell, who has spent much time studying *helianthi*, both on *Helianthus* and on *Cornus*, is also of the opinion that the green *Aphis* on *Cornus* is the spring and fall form of *A. helianthi*. First reported by Weed (as *cornifolia*).

†*A. illinoisensis* Shimer: Prairie Farmer, Vol. 18, No. 20, Nov. 17, 1866, p. 316. Although not positively proven, it is my opinion

that this species is identical with that described in 1880 by Doctor Thomas as *Macrosiphum (Siphonophora) viticola*. Shimer's description agrees in every respect with the well known *viticola*, excepting the statement about the "tubercles" (-cornicles?) and in this Shimer has contradicted himself, for while in the description he says "tubercles about one half the length of the tarsi," later in a discussion he speaks of the "horny tubes," in dried specimens, being about twice the length of the tarsi. Inasmuch as the original description of this species is inaccessible to nearly every worker, I consider it of importance to quote verbatim the description as given in the *Prairie Farmer*.

"A NEW GRAPE APHIS

"By HENRY SHIMER, M. D.

"*Larva* brown, anteriorly darkest. Green at first.

"*Pupa* brown. Rudimental wing and collar slightly tinged with green.

"*Imago* black. Thorax deep black. Abdomen brownish, transversely rugous, beneath, *i. e.*, segments beneath conspicuous; tubercles about one half the length of the tarsi, cylindrical, around the base of which, somewhat distant, the lateral margins of the posterior abdomen are conspicuously elevated. Legs black. Anterior femur above lower part of the anterior and middle tibia, premuscle and base of wing nervures grey. Antennae black. Setiform attaining the basal fifth of the stigma of the expanding wings. The first joint prominent, thick, sub-cylindrical, bevel margined on the upper end. Second shortest, not half the diameter of the first, but decidedly thicker than the following which gradually tapers to the pointed end. Third joint very long, longest, obclavate, the next three gradually shortening successively, the terminal abruptly smaller, setiform almost as long as the third. Eyes black, globular, prominent. Tibia; hairy, somewhat curved. First tarsal joint thick, not easily distinguishable from the tibia; second curved downward long and much tapering from the unguis toward the articulation. Wings hyaline, producing prismatic colors in the sunshine. Anterior wing long, the base acute angled from the middle. Exterior end rounded, in life erect, folded together, perpendicularly over the back, the posterior margin above. Nervures black. The terminal third of the narrow costal and sub-costal space filled with an opaque buff brown narrow elongate, falcate spot. Punctum marginal, about six times as long as wide, black on the posterior border, acute, obliquely pointed at each end tapering internally into the cubitus, and externally into the costal border, from the base of the terminal fifth. From the obtuse angle thus formed at the base of the terminal fifth springs the much curved intercalor stigmatic vein, being curved in the first part of its course — a true parabola with the principal vertex in the carpus, the third discoidal, the three branching vein arises from the internal point of the opaque space, second and first simple, the latter terminating in a tumefaction of the posterior marginal, a narrow elongate conspicuous vitta mostly internally from its extreme origin; a few long, very much attenuated, tapering acute capillary hairs arise from the third discoidal, below the first branch.

"Posterior wing small more pointed, obliquely incised on the anterior margin at the outer end, the sub-marginal vein also deflected parallel and very close to the incised border, decidedly closer than at the middle of the wing and terminating at the apex. Length to tip of wings, .14 inch, of body, .05, anterior wings, .10, antennae, .05."

Following this description Doctor Shimer gives notes on the habits, which agree with those of *M. viticola*, and the predaceous and parasitic insects of his species. He also discusses at some length on the differences between this and the European *A. vitis* Scop. At the end he adds a note, as follows.

"Note — Since writing the above I have seen this insect on wild grape and Mr. Walsh has informed me that he has examined carefully, some dried specimens

I sent him and that they were perfectly identical with the insect he saw, when he published for it *Scopolis Cypeosis*. With doubt he referred it to *Aphis vitis* Scopoli, P. Ent. Soc. vol. 1. There is no specific identity between this and the foreign insects as appears from the above description made from a thorough examination of hundreds of living insects, and as it is found in various parts of the state I would propose for it the specific name, *illinoisensis*."

^t*A. impatientis* Thos.: 8th Rept. State Ent. Ill. (1880), p. 98. First reported by Thomas and not since reported in literature except in catalogues. I am unacquainted with the species.

**A. lonicerae* Monl.: Bull. U. S. Geol. and Geog. Surv., Vol. V, No. 1 (1879), p. 26; Oestlund, Bull. Geol. and Nat. Hist. Surv., Minn., No. 4 (1887), p. 55. This interesting and peculiar aphid I have taken but once, namely at Oak Park, Ill., July 16, 1910, on *Lonicera* sp. At this time only wingless were found, and they were extremely abundant on the tender terminal shoots and leaves, more commonly on the former. The newer leaves have the sides curled upwards forming a pseudogall within which the aphids were also found. The colonies and individual aphids are covered with a heavy pulverulence. When the *Lonicera* shrub was examined a second time (23 Aug., 1910), only three immature individuals were found. The species is neither a typical *Aphis* nor *Chaitophorus* (in which latter genus Thomas placed it), but it unquestionably fits better in the former genus. Camera lucida drawings of the antennæ, hind tibia and tarsus cornicle, style and head of the wingless viviparous female are given in Plates 31-32, figures 6, 7, 8, 9 and 10, respectively.

^t*A. lutescens* Monl.: Bull. U. S. Geol. and Geog. Surv., Vol. V (1879), p. 23. I have taken this species twice in the vicinity of Chicago, on *Asclepias*. First reported by Monell.

A. maidis Fitch: Davis, Tech. Bull. Bur. Ent., U. S. D. A., No. 12, pt. VIII (1909), p. 144. Common on various weeds and grasses as well as on corn, broom corn, and sorghum, throughout the state. On the three cultivated plants mentioned it is often injurious, particularly so on broom corn where it discolors the broom, thus damaging the quality of brush. First reported by Thomas.

^t*A. maidi-radici* Forbes: 18th Rept. St. Ent. Ill. (1894), p. 58, figs.; Davis *loc. cit.* p. 123. One of the most destructive corn pests in Illinois; also of prime importance as an aster insect, having been found killing thousands of plants in single fields of asters in the vicinity of Chicago. First reported by Walsh.

**A. medicaginis* Koch: Thomas, 8th Rept. St. Ent. Ill. (1880), p. 101. This has proven a very important enemy of the black locust, which is grown extensively in the Chicago parks as shrubbery. The lice cluster on the tender terminal shoots and may become so abun-

¹ Illinois one of the type localities.

dant as to blacken them, not only stunting the growth, but often completely killing these tender branches.

¹*A. middletoni* Thos.: 8th Rept. St. Ent. Ill. (1880), p. 99; Vickery, Bull. U. S. Dept. Agr., Bur. Ent. No. 85, Pt. VI (1910), p. 113. I have never taken this species. First reported by Thomas (?).

**A. neilliae* Oest.: Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 59. This species has not, I believe, been reported since the original description, Professor Oestlund having found it in Minnesota on *Neillia opulifolia*, the common pine bark, now known as *Physocarpus (Spiraea) opulifolius*, a shrub much used in ornamental plantings. Last year (1909) at Oak Park, Ill., it became so abundant that the leaves were badly curled and the shoots stunted or even killed. The winged viviparous female is well characterized by the very tuberculate antennæ, brown wing veins, conspicuous black stigma and dark brown to blackish body color. The sexes were first observed October 9, and from the numbers of eggs already deposited they had been there for several weeks. At this time the leaves and shoots were covered with the aphids and dozens of pairs were observed *in copula*. The sexes are interesting in that the male is wingless as is also the oviparous female. These males are very small, brownish red to black and the ocelli absent. The oviparous females are entirely black. Eggs are laid by the hundreds in the crevices formed by the leaf petiole and stem, and by the dormant buds. This spring (1910) the eggs commenced hatching March 30, a few days after the leaves appeared.

⁴*A. nerii* Fonse.: Thomas, 8th Rept. St. Ent. Ill. (1880), p. 95. It is probable that Thomas found the species which he questionably referred to *nerii* in Illinois, although he does not so state. The record here is questioned.

**A. persicæ-niger* Smith, E. F.: Gillette, Jour. Econ. Ent. Vol. I (1908), p. 308, figs. and col. pl. A common pest of the peach.

A. pomi De G.: Gillette, *loc. cit.* p. 303. A common and often destructive pest of the apple in Illinois; also occasionally found injuring the tender shoots of the flowering or Japanese quince (*Cydonia japonica*) in the Chicago parks. First reported by Fitch.

**A. ænotheræ* Oestl.: Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 62. It is with some doubt that I record this species from Illinois. Specimens collected in Chicago on *Ænothera biennis* agree exactly with the description and habits as given by Oestlund except in the following: In addition to the marginal row of black spots the Chicago specimens have transverse dusky markings on

¹ The indications are that Thomas made his type collections in Illinois, but he does not say positively.

the three last abdominal segments. The cornicles are only two to two and a half times the length of the tarsi. The style is pale or pale greenish and not dusky or black as given in the original description.

**A. populifoliæ* Fitch: Cat. Homopt. N. Y. 1851, p. 66. This very interesting species was found infesting the tender terminal shoots and under surfaces of the leaves of the quaking aspen (*Populus tremuloides*), June 27, 1910, in one of the Chicago parks. All of the *P. tremuloides* in this park had recently been secured from their native habitat in Indiana, just across the state line and not far from Chicago. The same species was also taken on the common Carolina poplar (*P. deltoides*) in a Chicago nursery, June 30, 1910. August 23, the trees so heavily infested nearly two months before were visited, but not a single aphid could be found. Through the kindness of Mr. J. T. Monell I have had the privilege of examining specimens in his collections of this same species and which he has long considered to be the *populifoliæ* of Fitch. These Monell specimens are labeled "293x Washington, D. C., Sept. 30, 1880, *Populus alba*. From Theo. Pergande."

From the brief description given by Fitch it is difficult if not impossible to identify the species with certainty, although one might be led to believe that he was dealing with a species of the genus *Melanoxantherum*. Notwithstanding the slight differences in measurements the aphid in question is possibly the one Fitch was dealing with. *Populifoliæ* Fitch has generally been considered a species of the genus *Chaitophorus* but the one here considered, although showing marked *Chaitophorus* tendencies, is nearest related to the genus *Aphis*.

The *Chait. populifoliæ* as described by Oestlund¹ is clearly not Fitch's species. Through the courtesy of Professor Oestlund, I have examined the species which he described and questionably referred to the *populifoliæ* Fitch. It is a typical *Chaitophorus* and a new species which I propose shall hereafter be known as *Chaitophorus populifoliæ* Oestlund. These two species and a new species on poplar are fully described and discussed in another paper soon to be published and it is therefore sufficient to give here simply a brief description of the species which is being considered by the writer as Fitch's *populifoliæ*.

Wingless viviparous female.—Entire body dark reddish brown with very conspicuous white flocculent patches, namely a row on each side of the abdomen and two more or less regular longitudinal rows on the dorsum, one on each side of the median line. Under surface of abdomen with a large patch of whitish pulverulence. Antennæ not reaching to the base of cornicles; segment III longest, it being about twice the length of IV, IV and V subequal, base VI about half the length of V and a third the length of the filament. Legs with femur black excepting extreme base, tibia whitish except distal ends which are black and the tarsus black. Style black and moderately long, nearly one half the length of cornicles. Cornicles black, rather long, and cylindrical.

¹ Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 38.

Winged viviparous female.—Head and thorax black. Abdomen dark reddish brown with the posterior end darkening to blackish. Abdomen with a row of three small but conspicuous white pulverulent spots on each side of the median and anterior to the cornicles; also many other white pulverulent dots on the abdomen, but they are rather inconspicuous and easily rubbed off. Antennæ black; not reaching the base of the cornicles; relative lengths of antennal segments as in wingless; segment III with about 14 circular sensoria, more or less in a row, and the usual ones at distal ends of V and base VI. Legs with the femur blackish excepting basal end, tibia whitish or pale brownish with the distal one third or one half blackish, tarsus black. Wing veins dark, stigma blackish. Style black. Cornicles black, cylindrical, and reaching to the base of the style.

**A. prunifoliæ* Fitch: 1st Report Insects N. Y. (1855), p. 122. I have taken this species but once, namely on plum at Niles Center, Ill., June 18, 1908.

**A. sorbi* Kalt.: Sanderson, 13th Rep. Del. Agr. Exp. Sta., 1901 (1902), p. 149, 4 figs. A rather uncommon species, which I have taken only in northern Illinois.

†*A. quercifoliæ* Walsh: Proc. Ent. Soc. Phil. Vol. I (1862), p. 298. I am unacquainted with this species. First reported by Walsh.

A. rufomaculata Wils.: Ent. News, Vol. XIX (1908), p. 261. A serious pest of the greenhouse chrysanthemum. First reported by the writer.

**A. sambucifoliæ* Fitch: Sanborn, Kans. Univ. Sci. Bull. Vol. III, No. 1 (1904), p. 52, 2 figs. A very common species attacking the ornamental elder in the Chicago parks, but is not a serious pest. The sexual forms, the small winged males, and the wingless oviparous females, appear in September and October in northern Illinois, usually becoming mature the latter part of September.

†*A. salicicola* Thos.: 8th Rep. State Ent. Ill. (1880), p. 63 (Siphonophora). A common willow aphid in Illinois. First reported by Thomas.

†*A. setariæ* Thos.: 8th Rep. State Ent. Ill. (1880), p. 56; Oestlund Bull. Geol. and Nat. Hist. Surv. Minn. No. 4 (1887), p. 67. A very common species, occurring throughout the state. First reported by Thomas.

**A. spiræella* Schout. ?? In the JOURNAL OF ECONOMIC ENTOMOLOGY for October, 1910 (p. 404), Professor Gillette has noted this species as occurring in America. It has been very abundant and destructive on *Spiræa vanhouttei* and *S. salicifolia* in many parts of Illinois and after a careful study and comparison with the original description of *spiræella*¹ I consider it distinct but will leave it as above until specimens of the European species can be obtained (my efforts in this connection have thus far been useless) for comparison. The most noteworthy differences are in the antennal lengths which

¹ Zoölogisches Anzeiger, Vol. 25 (1902), pp. 656-657.

in all my winged specimens are exceptionally constant and the fact that *spirælla* rolls the leaves and as Schouteden says, "Die Blattmitzbildungen, welche *Aphis spiræa* [= *spiratella*] erzeugt, sind bereits von verschiedenen Cecidiologen beobachtet worden."¹

The following table of comparison may be of interest:

| | |
|--|--|
| Winged viviparous female. | |
| <i>A. spirælla</i> . Schout. | <i>A. spirælla</i> ?? from Illinois. |
| Under rolled leaves of <i>Spiræa ulmaria</i> . | Colonizing on the tender terminal shoots and leaves of <i>S. vanhouttei</i> and <i>S. salicifolia</i> . |
| Abdomen green, usually marbled. | Abdomen pale green. |
| Head and thorax black. | Head and thorax black. |
| Antennal measurements, III = longest. IV = three-fourths of III. V = one-half of III. (VI) = one-half of (VII). (VII) = about three-fourths of III. | Antennal measurements, III = four-fifths of (VII). IV = three-fourths of III. V = three-fourths of III. (VI) = one-third of (VII). (VII) = longest. |
| Beak reaching to hind legs. | Beak reaching to second pair of legs. |
| Style half the length of cornicles, dark green. | Style more than half the length of cornicles, black. |
| Cornicles black, paler at tip. | Cornicles black. |
| Wings transparent, wing veins (Wurzel und Unterrandader) greenish, cubitus twice or only once branched. | Wings transparent, wing veins pale brownish, cubitus twice branched. |
| Last segment of abdomen sometimes marked or striped with black. | Sometimes with dusky markings on abdomen as given, description below. |
| Wingless viviparous female. | |
| Antennæ shorter than body, blackish, third segment pale. | Antennæ shorter than body, segments I and II dusky, III and IV pale, V and VI darkening to black. |
| Relative antennal measurements about as in winged. | Relative antennal measurements about as in winged. |
| Legs greenish, tips of femora and tibiæ and the tarsi dark green. | Legs pale greenish white, excepting "knee" joint, tip of tibiæ and tarsi blackish. |
| Style hairy, nearly half length of cornicles, dark green. | Style moderately hairy, nearly half length of cornicles, black. |
| Cornicles dark green, black and somewhat thinner at tips. | Cornicles black, gradually narrowing towards the tip. |

Winged viviparous female.—Head (Pl. 32, fig. 14) and thorax black, abdomen pale green, and sometimes with a row of three dusky spots on each side anterior to the cornicles, one at the base of each cornicle, and a faint dusky transverse marking on each of the last two segments. Eyes black. Antennæ pale except the two basal segments which are dusky and the distal ends of V and all of VI which are blackish (in some specimens only the basal ends of the segments are pale, the tips being dusky to blackish), not reaching the base of cornicles, filament VI longest, III four fifths of filament VI, IV and V subequal and each about three fourths of III, base VI one third of filament VI; 6 or 7 rather large circular sensoria in a row on segment III, sometimes one or two on IV, and the usual ones at the distal ends of V and base VI (Pl. 32, fig. 16). Wing veins pale brownish, first and second discoidals

¹ *Loc. cit.* p. 657

branching at one third the distance from the tip of the wing to where the third branches (Pl. 32, fig. 17). Legs pale brownish, excepting the distal ends of femora, tibiae and all of tarsi which are blackish. Thoracic tubercle prominent. Smaller but similar tubercles along the sides of the abdomen. Cornicles black, cylindrical, and nearly one half longer than style (Pl. 32, fig. 18). Style black (Pl. 32, fig. 19).

Measurements.—(From specimens mounted in balsam.) Length of body, 1.2–1.59 mm., average, 1.39 mm.; width, 0.58–0.83 mm., avg. 0.64 mm.; length of wing, 2.1 mm.; width, 0.87 mm.; antenna, I, 0.057; II, 0.049; III, 0.179–0.260, avg. 0.216; IV, 0.131–0.195; avg. 0.160; V, 0.138–0.180, avg. 0.161; VI, base, 0.0815–0.114, avg. 0.098; VI, filament, 0.228–0.293, avg. 0.280; avg. total, 1.101 mm.; length of cornicles, 0.17–0.24 mm., avg. 0.205 mm.; style, 0.105–0.16 mm., avg. 0.14 mm.; hind tarsus, 0.10 mm.

Wingless viviparous female.—Body pale green, head dusky. Eyes black. Antennae with segments I and II dusky, III, IV, and basal half of V pale, end of V and all of VI blackish; relative lengths of segments as in winged form.¹ (Pl. 32, fig. 15). Legs pale greenish white excepting joints, distal end of tibiae, and all of tarsi which are blackish. Thoracic and abdominal tubercles as in winged. Cornicles black, very slightly narrowing towards the tip. Style black.

Measurements.—Length of body, 1.39 mm.; width, 0.85 mm.; antenna, I, 0.057; II, 0.049; III, 0.20–0.29, avg. 0.24; IV, 0.13–0.24, avg. 0.17; V, 0.14–0.21, avg. 0.17; VI, base, 0.098; VI, filament, 0.235–0.277, avg. 0.255; avg. total, 1.039 mm.; cornicles, 0.305 mm.; style, 0.175 mm.; hind tarsus, 0.115 mm.

The winged male may be recognized by the numerous sensoria on segments III, IV, and VI base, of the antennae; by its smaller size; and the greenish brown abdomen.

The wingless oviparous female is pale greenish yellow to yellow and the hind tibiae are swollen and bear many sensoria.

¹*A. symphoricarpi* Thos.: 8th Rep. State Ent. Ill. (1880), p. 99; Oestlund, Bull; Geol. and Nat. Hist. Surv. Minn. No. 4 (1887), p. 50. I have frequently searched for this species in Chicago and vicinity without success. There is no record of its occurrence in Illinois other than in Hunter's compiled list.

²*A. vernoniae* Thos.: 8th Rep. State Ent. Ill. (1880), p. 97; Sanborn, Kans. Univ. Sci. Bull., Vol. III, No. 1 (1904), p. 57, 2 figs. First reported by Thomas.

**A. viburnicola* Gill.: Ent. News, Vol. XX (1909), p. 280, 1 pl. Common on snowball (*Viburnum opulus*) in the vicinity of Chicago.

⁴*Cerosipha rubifolii* Thos.: Sanborn, Kans. Univ. Sci. Bull., Vol. III (1904), p. 44, figs. I place this species in Del Guercio's genus *Cerosipha* on the authority of Mr. H. F. Wilson. I have not seen the description of this genus, which Mr. Wilson has kindly informed me is in "Nuove Relazioni R. Stazione di Entomologia Agraria di Firenze, 1900, p. 116." This species is very common in Illinois, curling and injuring the foliage of the cultivated and wild blackberry.

¹Exceptions:—one individual had segment VI filament 0.024 mm. shorter than III, and another had VI filament and III of equal length.

²Carbondale, Ill., and Fort Dodge, Ia., are the type localities.

Thomas makes no mention as to the type locality of this species, but supposedly it was collected by him in Illinois.

Toxoptera graminum Rond.: Hunter, Bull. Univ. Kans., Vol. IX, No. 2 (1909), 221 pp., 66 figs., 9 pls., 3 col. pls. Ordinarily this species does not become injuriously abundant in Illinois, but occasionally it damages grain in southern and parts of western Illinois. First reported by Forbes.

**Hyadaphis pastinacæ* Linn.: ? Monell, Bull. U. S. Geol. and Geog. Surv., Vol. V, No. 1 (1879), pp. 26-27. (*Rhopalosiphum salicis*). Weed, Trans. Amer. Ent. Soc., Vol. XX (1893), p. 297 (*H. salicis*). This species I have taken on *Zizia aurea*, garden parsley, and *Salix*, in Illinois. On the parsley they became so abundant as to noticeably damage it. According to Schouteden the following synonyms have already been recognized,—*aegopodii* Scop., *capræ* Fabr., *cicutæ* Koch, *umbellatorum* Koch: It is with some hesitation that I add another species (*H. salicis* Monell) to the already long synonymy. All of the *Hyadaphis* which I have found on *Salix* agree well with the descriptions of *pastinacæ* and with the specimens taken on *Zizia aurea* and parsley. Also Mr. Monell has kindly made a careful examination of the type slides and in a letter dated October 14, 1910, he says, "I have just looked at it [type slide of *H. salicis*, collected June 15, 1878] under a $\frac{3}{4}$ objective, and I cannot see the tubercle [referring to a small acute tubercle on the dorsum of the penultimate abdominal segment and projecting caudad, a character which appears to be found in no other species of this genus] on specimens mounted back up but luckily one specimen is mounted sideways and I can see the 'horn' plainly. My recollection is this was quite a common species in 1878-1879, but now we seem to find only isolated specimens in colonies of the *Ch. viminalis*." In an earlier letter (October 6, 1910) Mr. Monell gives some interesting compiled data which I copy verbatim. "This *S. capræ* [= *pastinacæ*] on willow and *Umbellifera* does not seem to be an 'alternation' of food plants as witness these dates —

On willow.

In April, Kaltenbach's Monograph.

June 11, '77. Willow, Pergande notes, St. Louis, Mo.

June 15, '78. 150o St. Louis, Mo. Old types of *Rh. salicis*.

May 25, '86. 341x St. Louis, Mo.

Oct. 1, '10. Collected by Davis at St. Louis, Mo. [winged].

[Aug. 4, '09. Oak Park, Ill. Apterous only.]

On *Umbellifera*.

May 22, '07. On *Thaspium*, 539x, St. Louis, Mo. Apterous only.

June 19, '07. On *Heracleum*, 548, St. Louis, Mo. Apterous only.

July 1, '10. On garden parsley, 830x, Chicago, Davis, Apt. and winged.

Mar. 4, '91. *Aphis pastinaci* on celery, Washington (State?). Insect Life, Vol. IV, p. 213.

[Oct. 1, '08. On *Zizia aurea*, Chicago, Ill. Apt. and winged.]

The following average measurements from three collections may be of interest:

| Collection data | Antennal measurements in mm. | | | | | Sensoria |
|--|------------------------------|------|------|------|-----------------------|-------------------------|
| | III | IV | V | (VI) | (VII) | |
| Garden parsley, July 1, 1910, Chicago, Ill. | 0.34 | 0.13 | 0.13 | 0.13 | 0.16 | Sensoria only on III. |
| <i>Zizia aurea</i> , Oct. 1, 1908, Chicago, Ill. | 0.34 | 0.10 | 0.08 | 0.08 | 0.12 | Sensoria on III and IV. |
| Willow, Oct. 1, 1910, St. Louis. | 0.44 | | 0.08 | 0.08 | 0.10 broken off | Sensoria on III and IV |

In his description of the winged male and wingless oviparous female of *H. salicis* in Transactions of the American Entomological Society, Vol. XX (1893), p. 297, Weed mentions the characteristic abdominal tubercles referred to above. Camera lucida drawings of the tubercles or "horns" are given in Plate 32, figure 20 from the wingless viviparous female (a=tubercle; b=style) and figure 21 from the winged viviparous female, both drawn to the same scale.

Oestlund's *H. (Siphocoryne) archangelicæ* may also prove to be a synonym of *pastinacæ*.

**Hyalopterus arundinis* Fabr.: Oestlund, *loc. cit.* p. 44 (*phragmitidicola*). This species is exceedingly common in northern Illinois, where it thickly colonizes the leaves, usually on the upper surfaces, and along the mid-rib of *Phragmitis phragmitis*, which grows abundantly along country roadsides.

Rhopalosiphum berberidis Fitch: Davis, Annals Ent. Soc. Amer. Vol. I (1908), p. 254, figs. A common and often abundant species, occasionally in such numbers as to injure the barberry (*Berberis vulgaris*), a useful shrub in ornamental plantings. First reported by the writer.

R. nymphaeæ Linn.: Jackson, Ohio Naturalist, Vol. 8 (1908), p. 243, 1 plate. (*Aphis aquaticus*). In conservatories it often becomes quite troublesome on *Philotria canadense* and calla. Out-of-doors it is a common aphid on water plants such as *Nymphaea*, *Sagittaria* and *Lemna*. First reported by the writer.

**R. rhois* Monl.: Sanborn, Kans. Univ. Sci. Bull., Vol. III, No. 1 (1904), p. 64, figs. Often becoming exceedingly abundant on ornamental sumach, seriously disfiguring and weakening the plants.

†*R. solani* Thos.: 8th Rep. State Ent. Illinois (1880), p. 73. Have never taken this species, but an examination of the types in the State Laboratory of Natural History proves it to be a distinct and good species. First reported by Thomas.

**R. sonchi* Oestl.: 14th Ann. Rep. Geol. and Nat. Hist. Surv. Minn. (1886), p. 34. Found on *Sonchus* rather commonly in northern Illinois.

**R. violæ* Perg.: Can. Ent. Vol. 32 (1900), p. 30. I found this species quite common on cultivated violets in a greenhouse at Peoria, Ill., September 24, 1910, the first and only record we have of its occurrence in Illinois.

‡*M. achyranthes* Monl.: Bull. U. S. Geol. and Geog. Surv., Vol. V, No. 1 (1879), p. 18. Pergande¹ questionably places this species as a synonym of *M. mahaleb* and Gillette² has considered it the same as *M. persicæ*. I am unacquainted with the species. First reported by Forbes and Hart.

M. cerasi Fabr.: Weed, Bull. Ohio Agr. Exp. Sta., Tech. Ser. Vol. I, No. 2 (1890), p. 111; Gillette, Jour. Econ. Ent. Vol. I (1908), p. 362, col. figs. First reported by Thomas.

M. elæagni Del Guer.: Gillette, Can. Ent., Vol. XL (1908), p. 17, figs. (*M. braggi*); Davis, Annals. Ent. Soc. Amer., Vol. I (1908), p. 251, figs. A common species attacking ornamental Russian olive (*Elæagnus augustifolia*) and *Shepherdia argentea*, and although often becoming quite abundant, seldom injures the plants attacked. First reported by the writer.

M. persicæ Sulz. (= *Rhop. dianthi* Schr.): Gillette, Jour. Econ. Ent., Vol. I (1908), p. 359, col. figs. A very common and often pernicious pest in gardens and greenhouses, those plants which I have found it damaging most being cultivated snap dragon, carnation and ornamental pepper in greenhouses; and cabbage, spinach, and egg plant in the vegetable garden. I have examined what are probably the types of Thomas' *Rhop. tulipæ*, and they prove to be *persicæ* Sulz. First reported by Thomas.

**M. plantagineus* Pass.: I have taken this species on the common plantains (*Plantago rugelii* and *P. major*) on several occasions at Urbana, LeRoy, and Aurora. It lives on the base of the leaf stalks, on the under surface and near the ground, the aphid colonies often being covered with a "tent" of earth and débris constructed by the ants in attendance, usually the common field ant (*Lasius n. americanus*). Its habits are very much like those of the clover aphid (*A. bakeri*). Doctor Mordwilko, to whom specimens were sent, has

¹Bull. U. S. Dept. Agr., Div. Ent. No. 7 (1897), p. 52.

²Bull. Colo. Agr. Exp. Sta. No. 133 (1908), p. 32.

confirmed the writer's determination. I believe this species has not heretofore been reported from the United States.

The following descriptions were made from specimens collected at Urbana, Ill., July 15, and August 7; LeRoy, Ill., June 22; and Aurora, Ill., September 24.

Winged viviparous female.—Head (Pl. 32, fig. 22) and thorax dark, abdomen pale green with a reddish area around each cornicle. Eyes black. Antennæ on frontal tubercles, typical of the genus *Myzus*; subequal to or slightly longer than the body; filament VI longest, it being nearly $\frac{1}{4}$ longer than III, III nearly 1-3 longer than IV which is subequal with segment V, base VI 1-4 length of the filament or 1-3 length of III; 11-17 circular sensoria, usually more or less in a row on segment III, the usual ones at ends of V and base VI (in one specimen there were two small sensoria on segment IV); slightly imbricated, bare, and dusky to blackish excepting the two paler basal segments and basal end of III. (Pl. 32, fig. 26.) Wings with dark and conspicuous venation, the first and second discoidals branching at a little less than 2-3 the distance from where the third branches, to the tip of wing. (Pl. 32, fig. 25.) Legs pale excepting tarsi which are black. Cornicles pale, reaching to or slightly beyond tip of style, narrowest in middle and the tip very slightly swollen. (Pl. 32, fig. 23.) Style pale, typical of the genus, and about 1-2 the length of the cornicles. (Pl. 32, fig. 24.)

Measurements.—Length of body, 1.27 mm.; width, 0.55 mm.; length of wing, 2.22 mm.; width, 0.80 mm.; antenna, I, 0.065; II, 0.055; III, 0.375; IV, 0.277; V, 0.277; VI, base, 0.130; VI, filament, 0.49; total, 1.669 mm.; cornicle, 0.275 mm.; style, 0.130 mm.; hind tarsus, 0.114 mm.

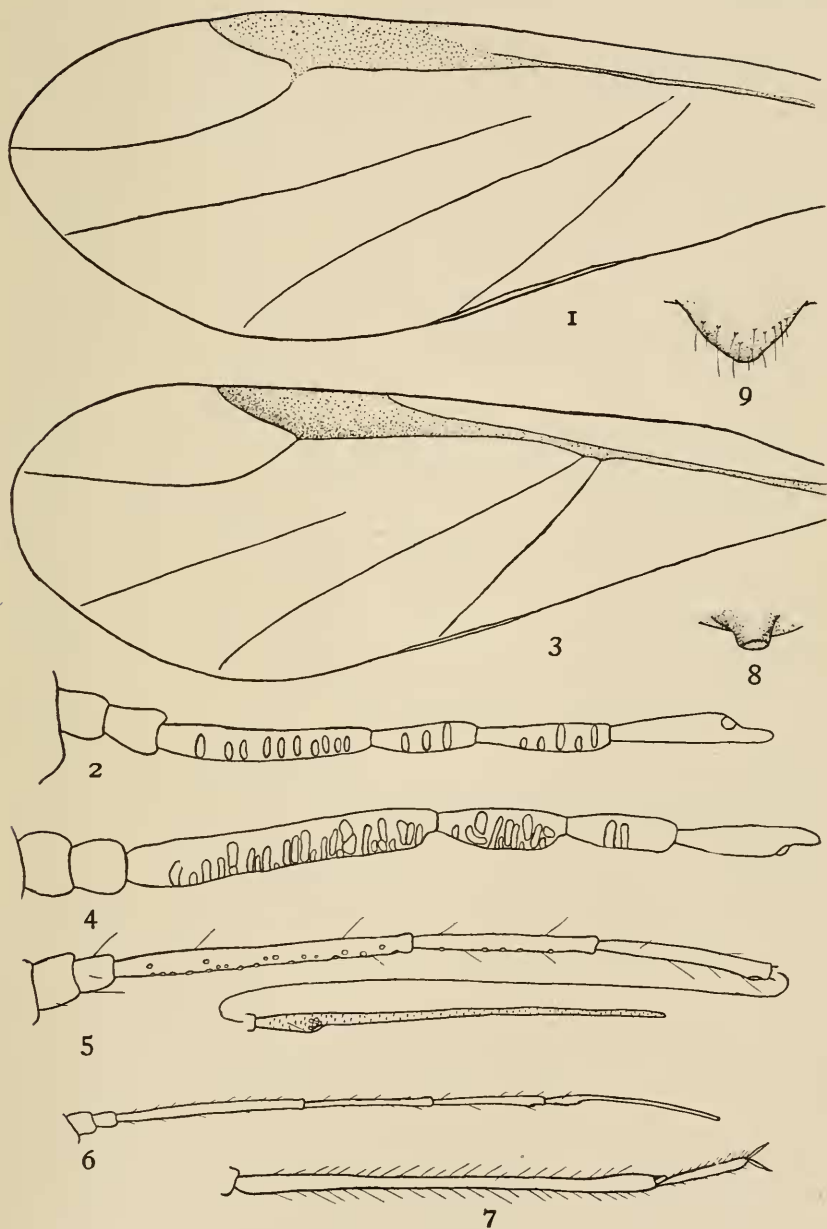
Wingless viviparous female.—Body cream colored to pale brownish yellow, the abdomen having also a distinct but very slight greenish tint. A small red area at the base of and around each cornicle. The red eyes of the embryonic aphids within the body are visible through the dorsal abdominal wall of the mature female. Eyes brownish black to black. Antennæ concolorous with the body excepting the dusky tip of IV, and also tip of V and all of VI, which are black; slightly longer than length of body, relative antennal lengths as in winged. (Pl. 32, fig. 27.) Legs pale or with a very pale brownish tint, and the tarsi black. Cornicles and style as in the winged.

Measurements.—Length of body, 1.6 mm.; width, 1.05 mm.; antenna, I, 0.075; II, 0.57; III, 0.407; IV, 0.277; V, 0.277; VI, base, 0.130; VI, filament, 0.489; total, 1.712 mm.; cornicle, 0.358 mm.; style, 0.135 mm.; hind tarsus, 0.114 mm.

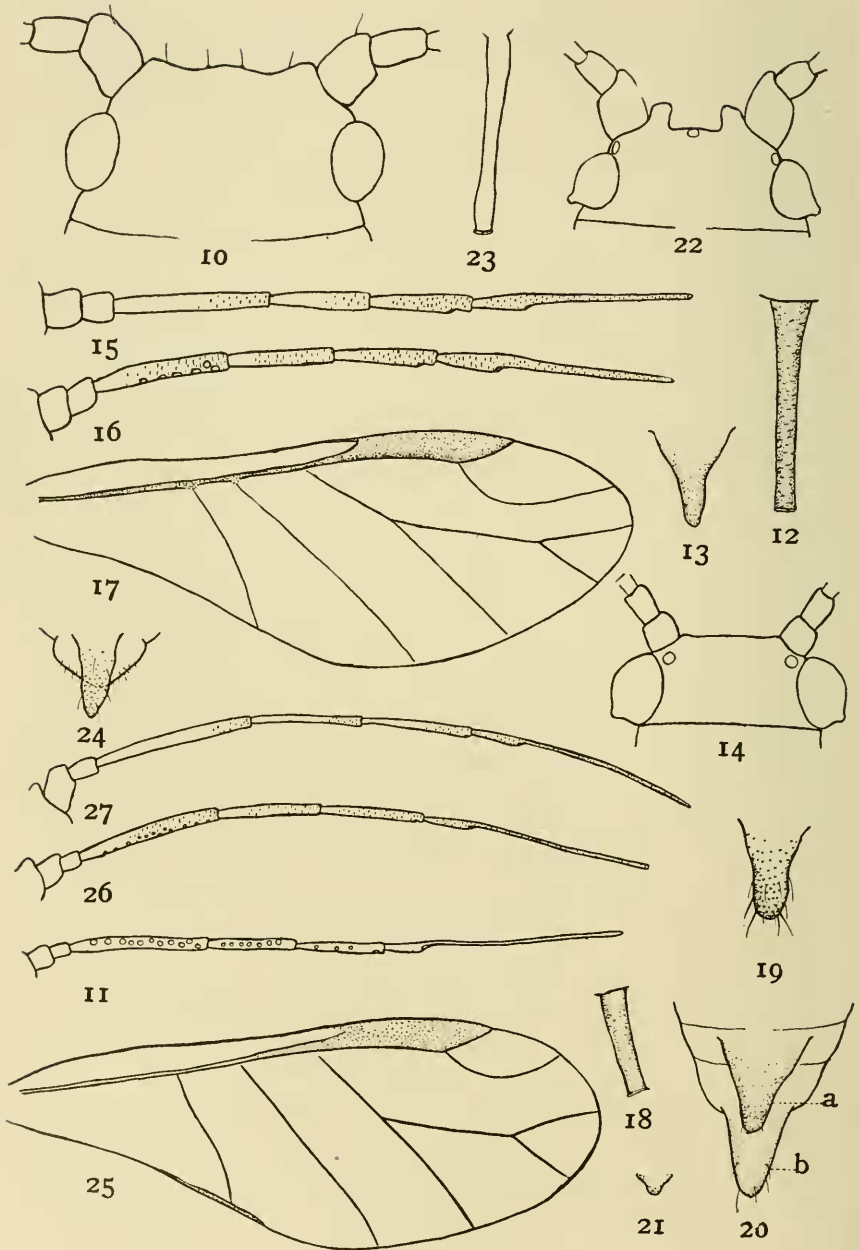
**M. ribis* Linn.: Oestlund, Bull. Geol. and Nat. Hist. Surv. Minn., No. 4 (1887), p. 74. Common throughout the state, and frequently a pest on the cultivated currant.

**M. rosarum* Walk.: Oestlund, 14th Ann. Rep. Geol. and Nat. Hist. Surv. Minn. (1886), p. 30 (*M. potentillæ*). A rose pest commonly found in Illinois on roses in greenhouses. They colonize the tender shoots, sometimes completely covering them and naturally killing the growth.

(To be concluded)



Structure of Aphididæ



Structure of Aphididae

Explanation of Plates 31 and 32.

Pemphigus corrugatus Sirt.—Fig. 1, wing; 2, antenna of winged viviparous female.

P. pyri Fitch (??).— Fig. 3, wing; antenna of winged viviparous female.

Aphis houghtonensis Troop.— Antenna of winged viviparous female.

A. loniceræ Monl.— Fig. 6, antenna; 7, hind tibia and tarsus; 8, cornicle; 9, style; 10, head of wingless viviparous female.

A. coreopsidis Thos.— Fig. 11, antenna; 12, cornicle; 13, style of winged viviparous female.

A. spiræella Schout. (?)— Fig. 14, head of winged viviparous female; 15, antenna of wingless viviparous female; 16, antenna; 17, wing; 18, cornicle; 19, style of winged viviparous female.

Hyadaphis pastinacæ Linn.— Fig. 20, abdominal tubercle on the wingless viviparous female; 21, on the winged viviparous female.

Myzus plantagineus Pass.— Fig. 22, head; 23, cornicle; 24, style and anal plate; 25, wing; 26, antenna of winged viviparous female; 27, antenna of wingless viviparous female.

Camera lucida drawings, figures 5, 8, 9, 10, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, with a one inch eyepiece and two third objective; 6, 7, 11, 26, and 27 with a two inch eyepiece and two third objective; 17 and 25 with one inch eyepiece and one and one half objective. Figure 3 is drawn to a scale about one third smaller than 1. Figure 2 and 4 are drawn to the same scale.

THE NEW FRENCH EXPORT PLANT INSPECTION SERVICE

By L. O. HOWARD

On page 76 of the current volume of the JOURNAL OF ECONOMIC ENTOMOLOGY (February, 1910) occurs an abstract of remarks made by the writer on the subject of European conditions as affecting nursery stock, in which it was shown that the French government had promised to establish a governmental inspection service in France, under the Ministry of Agriculture. These remarks were made at the Eighth Annual Meeting of Horticultural Inspectors at Boston, on December 26, 1909.

Early in November there was received at the Department of Agriculture through the French Ambassador to the United States and the U. S. Department of State, a statement to the effect that the service had been established, and transmitting more or less detailed information from the official journal of the French Republic. Information was conveyed that Dr. Paul Marchal, director of the Agricultural Entomological Station at Paris, had been placed in charge of the work, and the hope was expressed that the service established would be satisfactory to the government of the United States, on the understanding that the arrangement will not affect the right of the United States to examine shipments of living plants, where necessary.